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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/521,730	01/20/2005	Robert John Noel	MCA-609 US	2258

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EXAMINER	
SAUNDERS, DAVID A	
ART UNIT	**PAPER NUMBER**
1644	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/521,730	NOEL, ROBERT JOHN	
	Examiner	Art Unit	
	David A. Saunders, PhD	1644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-9 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-9 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

AMENDMENT ENTRY

Amendment of 1/20/05 has been entered. Claims 1-9 are pending. Claims 1-9 are under examination. The amendment has entered no new matter.

OBJECTION(S) TO DISCLOSURE

The disclosure is objected to because of the following informalities: At page 5, line 16, "sepharose" should be –Sepharose--, since it is a commercial product.

Appropriate correction is required.

REJECTION(S) UNDER 35 USC 112, SECOND PARAGRAPH

Claims 1-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, the phrase "in the absence of added ionic component that competitively binds the adsorbent" is indefinite, because one does not know if a) the "added ionic component" is one the competes with the "selected ionic component" for binding to the adsorbent, b) the "added ionic component" is one the competes with some unrecited undesired/non-selected ionic component for binding to the adsorbent, or both a) and b).

In claim 2, "wherein the adsorbent is cationic" is unclear as to whether this means that cationic groups/ligands are covalently bound to the adsorbent solid phase, or whether the adsorbent solid phase is one that exchanges cationic components of the sample. Literally, the claim appears to recite the former. However, everything exemplified by applicant appears to pertain to the latter (e.g. adsorbents that have anionic groups/ligands, such as sulfopropyl, that are covalently bound to the adsorbent solid phase and thus serve to exchange cationic components of the sample. Clarification and/or amendment is requested without entry of new matter.

In claim 7, "the protein" lacks antecedent basis. It is believed that dependency from claim 6 is intended.

In claim 8, "the protein" lacks antecedent basis. It is believed that dependency from claim 6 is intended.

REJECTION(S) UNDER 35 USC 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 5-7 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Scholz et al (cited on Form 1449).

Scholz et al show that immunoglobulin protein from human serum can be adsorbed to a thiophilic adsorbent, which has a binding "ligand based on mercaptonicotinic acid, containing a carboxylic group". See last sentence of abstract, Table 3, and the para. spanning pgs 195-196. This adsorption of immunoglobulin can occur in both a salt-promoted and a salt-independent manner. See sentence spanning pgs 195-196.

Claim 1 is anticipated for the embodiment of Scholz et al in which the adsorption of immunoglobulin occurs in a salt-independent manner. This rejection is based on the fact that claim 1 is vague and indefinite as to what is meant by the phrase "in the absence of added ionic component that competitively binds the adsorbent" (112 supra), and the fact that it is not clear how this phrase relates to the teachings of the specification. In this particular rejection, the examiner interprets the phrase "in the absence of added ionic component that competitively binds the adsorbent" as meaning that the "added ionic component" is one the competes with the "selected ionic component" for binding to the adsorbent (i.e. interpretation "a)" contemplated under 112 rejection above); and the examiner takes this as further meaning that there is no, or a minimal amount of, added salt (e.g. Na_2SO_4 or NaCl that would "compete" with the "selected ionic component" (i.e. the immunoglobulin) for binding to the adsorbent.

It is further noted that the "ligand based on mercaptonicotinic acid, containing a carboxylic group" has a carboxylic group that is ionized. See para. spanning pgs 195-196. Thus adsorbent of Scholz et al is an "ionic adsorbent" as required by claim 1. The fact Scholz et al may consider that ionic binding is not the most prominent factor in the adsorption process (para. spanning pgs 195-196) does not detract from anticipation.

It is further to be noted that the examiner interprets the phrase "such that the component is bound selectively" to merely require that some, but not necessarily all, of the "selected ionic component" (i.e. the immunoglobulin) binds to the ionic adsorbent. That is, the fact that Scholz et al show that there are approx. equal amounts of bound (adsorbed) and non-bound (non-adsorbed) IgG to the column (in Table 3) does not detract from anticipation.

Regarding the limitation in claim 1 concerning "charge density", this is anticipated, since there is no quantitative value recited concerning the "charge density". As well, there is no quantitative value recited concerning what is meant by "bound selectively".

For the above reasons, claims 1 and 6-7 are anticipated.

Claim 2, is anticipated since the ionized carboxyl group on the adsorbent is inherently a cation exchanger (note ambiguity concerning claim 2, under 112 supra).

Claim 5 is anticipated since human serum would contain numerous proteins other than IgG which would not be bound/adsorbed.

Claim 9 is anticipated since Schloz et al eluted (desorbed) unbound IgG with NaOH. See Table 3.

Claims 1-3, 6 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by DePhillips et al (cited on Form 1449).

DePhillips et al show experiments in which they prepare various, individual protein solutions, each with a buffer of 10 mM sodium phosphate. DePhillips et al then apply samples of each of these protein solutions to each of a series of cation

exchangers/adsorbents (listed in Table 1), such that the proteins are adsorbed to each of the exchangers. DePhillips et al then elute the adsorbed protein from each of these cation exchangers, by varying NaCl concentration in the 10 mM sodium phosphate buffer. See especially pgs 60-61.

Instant claim 1 is anticipated since each of the proteins (corresponding to the instant "selected ionic component") is contacted with the adsorbent in the absence of NaCl (the cation thereof corresponds to the instant "added ionic component that competitively binds the adsorbent). Since the proteins bind to the adsorbents, it is taken that each of the adsorbents had a "charge density such that the component is bound selectively". Thus all features of claims 1 and 6 are shown.

Claim 2, is anticipated since the adsorbent is a cation exchanger (the 2nd interpretation of claim 2, noted under 112 supra).

Claim 3 is anticipated since DePhillips et al tested two anion exchangers/ adsorbents that have sulfopropyl groups as the ligand (Table 1).

Claim 9 is anticipated since DePhillips et al eluted (desorbed) protein from each of the columns by varying NaCl concentration in the 10 mM sodium phosphate buffer. See especially pgs 60-61 and Figs.1-6.

Claims 1-2, 4 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Wu et al (Jour. Chromat. 598,7-13, 1992, cited on Form 892).

Wu show experiments in which they prepare various, individual protein solutions, each in a buffer of 0.01M (10 mM) sodium phosphate. DePhillips et al then apply samples of each of these protein solutions to each of a series of carboxylate cation-exchangers/adsorbents having different carboxylate ion (ligand) densities, such that the proteins are adsorbed to each of the exchangers. At a carboxylate ligand density of 70

umol/g the exchanger/adsorbent starts to become saturated with protein (e.g. lysozyme). See pgs 8-10 and Fig. 2.

Instant claim 1 is anticipated since, under conditions in which one uses a "weak mobile phase" (para. spanning pgs 8-9), each of the proteins (corresponding to the instant "selected ionic component") is contacted with the adsorbent in the absence of a salt (e.g. Na_2SO_4 or NaCl that would "compete" with the "selected ionic component" for binding to the adsorbent). Since the proteins bind to the adsorbents, it is taken that each of the adsorbents had a "charge density such that the component is bound selectively"; furthermore the examiner calculates that the carboxylate ligand density of 70 umol/g would correspond to a density of ~11 umol/ml and that the carboxylate ligand density of 173 umol/g (both values shown in Fig 2) would correspond to a density of ~26 umol/ml; see 5,945,520 at col. 3, lines 25-27 for a teaching that 1 mmol/g roughly corresponds to 150 umol/ml). Thus all features of claims 1, 4 and 6 are shown.

Wu et al then elute the adsorbed protein from each of these cation exchangers, by varying sodium sulfate concentration in the 10 mM sodium phosphate buffer (See Fig. 4); thus claim 9 is anticipated. Claim 2, is anticipated since the adsorbent is a cation exchanger (the 2nd interpretation of claim 2, noted under 112 supra).

Claims 1-3 and 5- 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Ramage et al (5,644,036, cited on Form 892).

Ramage et al disclose a method of purifying an IgG antibody. The antibody is first purified on a Protein A or Protein G affinity column, by adsorption thereto and then eluted therefrom in 0.1M citric acid. The eluted preparation from this affinity column corresponds to the instant "sample". This "sample" contains both the IgG and Protein A that has leached from the affinity column. This "sample" is then added to a cationic exchange column having S-Sepharose FF as the adsorbent. As far as the examiner can determine from the disclosure, the IgG binds to the cation exchanger and the Protein A does not (e.g. col. 4, line 55-col. 5, line 5; col. 12, lines 51-67; and claim 1, part c)

thereof). There is thus selective binding of the IgG (instant "selected ionic component") to the cation exchanger. Instant claim 1 is anticipated since the IgG protein is contacted with the adsorbent in the absence of added salt (e.g. Na_2SO_4 or NaCl that would "compete" with the "selected ionic component" (i.e. the immunoglobulin) for binding to the adsorbent. Since the IgG protein, but not Protein A, binds to the adsorbent, it is taken that S-Sepharose FF adsorbent had a "charge density such that the component is bound selectively".

Claim 2, is anticipated since the adsorbent is a cation exchanger (the 2nd interpretation of claim 2, noted under 112 supra). Claim 3 is anticipated, since S-Sepharose FF has sulfopropyl groups (see 7,214,321 at col. 19, lines 11-13 for evidence). Instant claims 5-8 are anticipated since IgG protein binds to the adsorbent and Protein A does not. Claim 9 is anticipated, since Ramage et al wash the column having bound IgG and then elute the IgG with a salt gradient (e.g. col. 5, lines 1-5).

ART OF INTEREST

The art made of record and not relied upon is considered pertinent to applicant's disclosure.

Bonnerjea et al (2006/0194953) is of interest with respect to the separation of an immunoglobulin and Protein A by ion-exchange chromatography.

Angus et al (2005/0020812) is of interest for showing an affinity chromatography medium with low ligand density.

CONTACTS

Any inquiry concerning this communication from the examiner should be directed to David A. Saunders, PhD whose telephone number is 571-272-0849. The examiner can normally be reached on Mon.-Thu. from 8:00 am to 5:30 pm and on alternate Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Chan, can be reached on 571-272-0841. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Typed 5/8/07 DAS

David A Saunders

DAVID A. SAUNDERS
PRIMARY EXAMINER